

WHAT IS CLAIMED IS:

1. An electronic control system having at least first, second and third mutually communicating control units and a memory, wherein during transmission of a safety-related transmitted signal from the first control unit to the second control unit:

the first control unit generates the transmitted signal and a second signal complementary thereto on different paths and, sends them to the memory, together with two additional signals, which are indicative of the respectively paths;

the third control unit reads out the transmitted and additional signals from the memory, and checks them, and i) upon detection of an error, switches off the first control unit or, ii) if the signals are correct, generates different types of test or safety signals and sends them to the memory; and

the first control unit reads out the test or safety signals from the memory and checks them and, i) upon detection of an error, switches itself off, or ii) if the test or safety signals are correct, feeds the transmitted signal and at least one prescribed selection of the test or safety signals to the second control unit.

2. The control system according to Claim 1, wherein the second control unit tests the transmitted selection of the test or safety signals and disregards the transmitted signal upon detection of an error.

3. The control system according to Claim 1, wherein the second control unit processes or obeys the transmitted signal if the test or safety signals are correct.

4. The control system according to Claim 1, wherein the second control unit returns one of the received transmitted signal and an acknowledgment signal correlated therewith, to the first control unit, which checks the fed signal and i) upon detection of an error, switches the control system to an emergency operating or standby operating mode, and ii) if the signal is correct, causes the fed signal to be processed further.

5. The control system according to Claim 1, wherein:  
if the test or safety signals are correct, the first control unit relays the transmitted signal and the selection of the test or safety signals to the second control unit via a data bus transmitter, which data bus transmitter returns the transmitted signal and the selection of the test or safety signals to the second control unit and to the first control unit, respectively; and

the first control unit compares the transmitted and the returned signals and turns itself off in the event of signal deviations.

6. The control system according to claim 1, wherein the transmitted signal and the second signal are complementary to one another in a bitwise fashion.